Editorials

To the Young Doctors Who Are Just Now Starting Practice

YOU ARE ABOUT to enter a challenging, stimulating and fascinating career. Medical science has advanced far. Medical practice affects and is affected by events in the technologic, social, economic and political environment in new and as yet poorly understood ways. Both the science of medicine and the environments of practice are changing continuously and you will always be pressed to keep pace. But patients—the persons whose illnesses, health and quality of life are your professional concern—do not change all that much, nor does the humanity that populates the environment within which you will practice.

Your training, especially if American, places you among the best trained doctors scientifically that the world has ever known. Your training in what we call the art, that is linking your scientific knowledge and skills to caring for the needs of a patient as a whole person, may have left something to be desired, as may your training in the social, economic, legal and political aspects of medical practice and of the health care system within which you will work.

Paradoxically it is the progress in medical science in which you are so well trained that has created many of the as yet unsolved problems in the health care environment. Very briefly, this progress has brought about significant specialization and subspecialization within our profession and an unprecedented proliferation of allied health professionals who now seek to advance their professional status and expand their scope of practice. As new knowledge and new technology have come into being, diagnosis and treatment have become more effective, life expectancy has been substantially extended and more people are requiring more of your care. As the number of health professionals has increased, as more sophisticated and effective diagnosis and treatment have become more widely available and used, and as more people need and use more care, the expense has risen in apparently uncontrollable fashion. In one way or another costs now will dominate your practice. So you must be careful that you always try to do what is best for your patients in what will be a very cost-sensitive health care environment.

Society is confused about what to do about health care and its rising cost. You must remember it is society that decides the scope of medical practice and it is society that decides what it will pay for health care. Society has said it wants more health care for more people and equal access for all to high quality care, but is now balking at the expense. Many attempts have been made to control costs through laws and government regulations but these have not worked, perhaps because our legal system is ill-adapted to regulate or control a system that changes as rapidly and continuously as does health care. Right now society is trying to view health care more as a business or many businesses competing with one another. It is attempting to introduce competition and business practices into the system in the probably forlorn hope that this will lessen costs. This approach threatens the quality of patient care and of course makes a travesty of equal access for all to quality care. There will be agreements or contracts to provide care that will tend to go to the lowest bidder. As is the case in any business or industry, patients or the public will get the amount and quality of care they are willing to pay for. So as you start your practice now it will be in a volatile economic environment whether you choose to be solo, in a private practice group, in a health maintenance organization (HMO), in an independent practice association (IPA), a hospital-based physician, in the employ of one of the rapidly emerging corporate organizations or some other arrangement. Regardless, it is important that you never forget that your primary obligation is the historic responsibility of doctor to patient. This always must come ahead of any business or corporate responsibilities.

Medicine is a grand profession. It is a fascinating amalgam of science, caring and human compassion, and now with yet new human dimensions, as technology poses ethical problems, and as new and growing social, economic and political interdependencies begin to demand new knowledge and new skills of our profession and those who practice it. It seems certain that the expertise of medicine will find new means of expression as humanity struggles for health and quality of life in this closed biosphere called planet Earth, with its intrinsically complex and interdependent networks of technologic, social, economic and political systems which impinge in one way or another upon human illness, health and quality of life. There will be many new challenges and opportunities to develop new knowledge, skills and expertise to benefit patients and improve the health of all the people.

You will see and be part of many changes. You and our profession should remain steadfast in our basic purpose: to provide the best care and treatment for patients. Changing science and changing practice environments will challenge you to maintain and enhance your professional competence and your accountability for your practice performance. The social, economic and political whirlwind in which you are starting your practice will pose many foreseeable and some not so foreseeable problems. Fortunately your skills in problem solving are highly developed and can now be adapted for use far beyond the basic diagnosis and treatment of illness for which you were trained. Take care of your own health. You owe this to your-

selves, your families, your patients and to society which gives you your license to practice. You are entering practice at a time of unprecedented challenge and excitement. It should be both fun and satisfying for you to face and meet these many challenges. I wouldn't mind being one of you! —MSMW

Seizures From Theophylline Use

IN A RECENT two-year study of theophylline toxicity,[1] 17 percent of 3,112 serum theophylline concentrations were greater than 20 μg per ml, the upper limit of the usual therapeutic range. Of 87 patients with serum theophylline concentrations higher than 20 μg per ml, almost all had one or more symptoms or signs of toxicity, including tachycardia, tremor, nervousness, irritability, nausea, vomiting, diarrhea, headache and seizures. Of 19 patients who had values of more than 40 μg per ml, four had seizures. None of the patients with values below 40 μg per ml had seizures. Seizures from theophylline can result in status epilepticus and can have a fatal outcome. In one series[2] four of eight patients with seizures due to theophylline use died. Seizures have been reported with intravenously given aminophylline, orally given theophylline[3] and aminophylline given by suppositories.[4] Suicide attempts have been made by ingesting an overdose of theophylline. Of nine such suicide attempts described in one report, three of the nine patients had seizures and those three died.[5] The six who did not have seizures survived.

Seizures from theophylline use usually occur with serum theophylline concentrations above 35 μg per ml.[2] Other side effects clearly occur with concentrations within the therapeutic range of 10 to 20 μg per ml.[6] Several individual cases have now been reported in which patients had seizures due to theophylline use, with theophylline concentrations of less than 35 μg per ml.[2,7] Nakada and colleagues in this issue of the journal add three more patients to this group; their three patients had seizures likely from theophylline use with theophylline values of 17, 20.5 and 24 μg per ml at the time of the seizures. Results of an autopsy done on two of the patients showed no structural lesion in the brain to explain the seizures. One possible explanation for seizures occurring at low theophylline concentrations is decreased binding of theophylline to plasma proteins, making more free drug available for diffusion into tissues.[8] Nakada and co-workers did not measure the amount of theophylline bound to protein, though all three of their patients had low serum albumin levels.

Treatment of seizures from theophylline toxicity is difficult, making prevention of paramount importance. The seizures are refractory to anticonvulsive medication. Theophylline therapy should be stopped immediately and the theophylline concentration should be decreased as soon as possible. Resin and charcoal hemoperfusion has been reported to reduce theophylline concentration, but a recent review of renal dialysis for theophylline toxicity points out that even with rapid reduction of the serum theophylline value the outcome has not always been favorable.[9] For attempted suicide with theophylline overdose, vomiting should be induced, then activated charcoal and cathartics given.[9]

Prevention of theophylline toxicity requires some knowledge of pharmacokinetics of theophylline. The half-life varies in asthmatic adults who are otherwise healthy from 2.9 to 12 hours.[7] Similar variation occurs in children. Thus, one dosage schedule is not applicable to all patients. Serum theophylline values should be used to guide therapy. Guidelines for theophylline therapy have been published,[7,9,10] and a patient's past experience with theophylline should be considered.

Diseases that prolong the theophylline half-life and thus require a decreased dose include congestive heart failure, liver disease, influenza and possibly other respiratory and febrile illnesses.[7] A growing number of drugs that are being reported to delay theophylline metabolism also require a reduction in the dose. Troleandomycin,[11] erythromycin[12] and cimetidine[13] are well-documented examples. Furosemide,[14] thiabendazole,[15] allopurinol at a dose of 600 mg per day but not at 300 mg per day,[16] propranolol but not metoprolol,[17] hydrocortisone[18] and influenza immunization[19] have all been reported to delay theophylline metabolism and thus could cause toxicity in patients on stable theophylline regimens.

Seizures are an uncommon but serious complication of theophylline therapy. Most of these seizures result from toxic theophylline serum concentrations and can be prevented by application of pharmacokinetic knowledge of theophylline use and by monitoring therapy with measurement of serum theophylline values.

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